

National Climatic Data Center

DATA DOCUMENTATION

FOR

DATA SET 3220 (DSI-3220)

SUMMARY OF THE MONTH (SOM) COOPERATIVE

March 18, 2003

National Climatic Data Center
151 Patton Ave.
Asheville, NC 28801-5001 USA

Table of Contents

Topic	Page Number
1. Abstract.....	3
2. Element Names and Definitions:	3
3. Start Date.....	11
4. Stop Date.....	11
5. Coverage.....	11
6. How to order data.....	11
7. Archiving Data Center.	11
8. Technical Contact.....	11
9. Known Uncorrected Problems.....	11
10. Quality Statement.....	12
11. Essential Companion Data Sets.....	12
12. References.....	12

1. **Abstract:** Information contained in this Summary of the Month (SOM) data file is primarily that from the cooperative network, augmented by observations from principal climatological stations operated by the National Weather Service and other sites having highly trained observers. This file contains data from 1831 and onward.

The primary thrust of the cooperative observing program today is the recording of 24-hour precipitation amounts, but about 55% of the stations also record maximum and minimum temperatures. Principal stations are usually fully instrumented and therefore record a complete range of meteorological parameters. Through the years, more than 23,000 stations have recorded observations in this program but seldom were there more than 12,000 in operation at any time. Some 285 principal climatological stations report most of the elements. The remaining stations usually report fewer elements.

Areal coverage includes the U.S., Alaska, Hawaii, some Pacific and Caribbean Islands, and selected Central American stations. The digital file contains record type, station identification, unit of measurement indicators, data quality flags, and element types. Annual totals and means were derived at the end of each year. The values are present in the 13th value. The first 12 values represent the 12 months of the year.

Cooling Degree Day and Divisional Values are available only from 1980 forward. Divisional data before 1980 are available in TD9640 Divisional Averages Temperatures, Precipitation, and Normals.

2. **Element Names and Definitions:**

01-03	RECORD-TYPE	The type of data stored in this record. Value is "MLY" (Monthly).
04-11	STATION-ID	Eight (8) character station identifier assigned by the NCDC. See breakdown below
04-05	State Code	State code. Range = 01-96.
	01 Alabama	43 Vermont
	02 Arizona	44 Virginia
	03 Arkansas	45 Washington
	04 California	46 West Virginia
	05 Colorado	47 Wisconsin
	06 Connecticut	48 Wyoming
	07 Delaware	49 Not Used
	08 Florida	50 Alaska
	09 Georgia	51 Hawaii
	10 Idaho	60 Bahamas
	11 Illinois	61 Turks & Caicos Islands
	12 Indiana	62 Cuba
	13 Iowa	63 Jamaica
	14 Kansas	64 Haiti
	15 Kentucky	65 Dominican Republic
	16 Louisiana	66 Puerto Rico
	17 Maine	67 Virgin Islands
	18 Maryland	68 Netherlands Antilles, North
	19 Massachusetts	69 Antigua, Leeward Islands
	20 Michigan	70 Guadeloupe
	21 Minnesota	71 Martinique

:
:
:

22 Mississippi	72 Grenada, Windward Islands
23 Missouri	73 Tobago
24 Montana	74 Trinidad
25 Nebraska	75 Netherlands Antilles, South
26 Nevada	76 British Guiana
27 New Hampshire	77 Surinam
28 New Jersey	78 Venezuela
29 New Mexico	79 Colombia
30 New York	80 French Guiana
31 North Carolina	81 British Honduras
32 North Dakota	82 Costa Rica
33 Ohio	83 El Salvador
34 Oklahoma	84 Guatemala
35 Oregon	85 Honduras
36 Pennsylvania	86 Nicaragua
37 Rhode Island	87 Panama Canal Zone
38 South Carolina	88 Mexico
39 South Dakota	90 Barbados
40 Tennessee	91 Pacific Islands
41 Texas	96 Canada
42 Utah	

NOTE: STATE NUMBER PERIOD OF RECORD
 60 1960-1967
 61-65, 68-88 1960-1964 (overall)

06-09 *Cooperative Network Index Number.* Assigned by the NCDC.
 Range = 0000-9999. 9999 = missing/not assigned.

10-11 *Cooperative Network Division Number.* Assigned by the NCDC.
 Range = 01-10, and 99. 99 => missing division number. (A
 station's division number can change through time.)

HAWAII (State Code 51) - from Table B

ISLAND	DIVISION
Kauai	01
Oahu	02
Molokai	03
Lanai	04
Maui	05
Hawaii	06

Hawaii's division numbers were changed during the initial conversion of this file. Divisions within islands no longer exist; however, division numbers now represent each island.

PACIFIC ISLANDS (State Code 91)

DIVISION

02 - East of 180th Meridian - Phoenix Islands, Line Islands, and American Samoa
 03 - Western Pacific Islands, North of 12N.
 04 - Caroline and Marshall Islands

:
:
:

12-15	ELEMENT-TYPE	Four (4) characters. Identifies the type of data element stored in this record. Range is listed below. (Metric units were used by most of the Caribbean countries except Puerto Rico and the Virgin Islands.)
	CLDD	Monthly cooling degree days - base 65 F. (1980 onward)
	DP01	Number days with \geq 0.1 inch precipitation. (1954 onward)
	DP03	Number days with \geq 3.0 millimeters precipitation. (Metric stations only)
	DP05	Number days with \geq 0.5 inch precipitation. (1951 onward)
	DPOH	Number days with \geq 0.01 inch precipitation. (Only before 1954)
	DPOQ	Number days with \geq 0.25 inch precipitation. (Only before 1951)
	DP10	Number days with \geq 1.0 inch precipitation.
	DP25	Number days with \geq 25.0 millimeters precipitation. (Metric stations only.)
	DP50	Number days with \geq 50.0 millimeters precipitation. (Metric stations only.)
	DPNP	Departure from normal monthly precipitation.
	DPNT	Departure from normal monthly temperature.
	DSNW	Number days with snow depth \geq 1 inch.
	DT00	Number days with minimum temperature \leq 0 F.
	DT15	Number days with maximum temperature \leq 15 C. (Metric stations only.)
	DT30	Number days with maximum temperature \geq 30 C. (Metric stations only.)
	DT32	Number days with minimum temperature \leq 32 F.
	DT60	Number days with minimum temperature \leq 59 F. (Puerto Rico and Virgin Islands only.)
	DT70	Number days with maximum temperature \geq 70 F. (Alaska only.)
	DT90	Number days with maximum temperature \geq 90 F.
	DX15	Number days with maximum temperature \leq 15 C. (Metric stations only.)
	DX32	Number days with maximum temperature \leq 32 F.

:
:
:

DX60 Number days with maximum temperature \leq 59 F. (Puerto Rico and Virgin Islands only.)

EMXP Extreme maximum daily precipitation in the month. (Contains the day of occurrence in the DAY field.)

EMNT Extreme minimum temperature for the month. (Contains the day of occurrence in the DAY field.)

EMXT Extreme maximum temperature for the month. (Contains the day of occurrence in the DAY field.)

FRZD - Freeze Data

Freeze data contains the dates of the last spring (1 January through 30 June) and the first fall occurrences (1 July through 31 December) for five thresholds of temperature (16, 20, 24, 28, and 32 degrees F). The NUMBER-VALUES field indicates there are 10 data groups (threshold positions) to follow. The MONTH and DAY fields contain the date of occurrence. The DATA-VALUE field contains the sign and actual temperature.

Example: The first threshold position (Table C below) represents the last occurrence of a temperature \leq 16 DEGREES F in the spring. It will appear as 020700016 (February 7th, temperature was 16 degrees F.)

Threshold Position	Meaning (From Table C)		
1	Temp \leq 16 F	Last occurrence in the Spring	
2	Temp \leq 20 F		
3	Temp \leq 24 F		
4	Temp \leq 28 F		
5	Temp \leq 32 F		
6	Temp \leq 16 F	First occurrence in the Fall	
7	Temp \leq 20 F		
8	Temp \leq 24 F		
9	Temp \leq 28 F		
10	Temp \leq 32 F		

For no occurrences: MONTH = 99
 DAY = 99
 DATA-VALUE = -99999
 FLAG-1 = M
 FLAG-2 = +

HTDD Monthly heating degree days - base 65 degrees F. (July 1950 onward.)

MMNP Monthly mean minimum temperature of evaporation pan water.

MMNT Monthly mean minimum temperature.

MMXP Monthly mean maximum temperature of evaporation pan water.

:
:
:

MMXT Monthly mean maximum temperature.

MNTM Monthly mean temperature.

MXSD Maximum snow depth during the month. (Contains the day of occurrence in the DAY field.)

TEVP Total monthly evaporation.

TPCP Total monthly precipitation.

TSNW Total monthly snowfall.

TWND Total monthly wind movement (in miles) over evaporation pan.

DIVISIONAL DATA

Divisional Data records are from 1980 onward. Data are parts of the SOM file, but are maintained on separate digital tapes.

DAPT Divisional average total monthly precipitation. (Through 1981 only.)

DPNP Departure from normal monthly precipitation. (Through 1981 only.)

DPNT Departure from normal monthly temperature.

MDRN Number of days in the month with rain. (1982 onward.)

MNTM Monthly mean temperature.

TPCP Divisional average total monthly precipitation for all stations that observe precipitation and temperature, and stations that observe precipitation only.

TSNW Total monthly snowfall.

SOIL DATA

Soil records are from 1982 forward. The last two digits on soil element names represent codes for soil cover and soil depth. Example: "MN11" represents the element name for mean monthly soil temperature of grass cover at 2 inches and/or 5 cm. There is no distinction whether the depth reading is read in inches or centimeters. See "DATA QUALITY: Known Uncorrected Problems" paragraph before using soil records. When using soil data you must examine the FLAG-1 and FLAG-2 fields. FLAG-1 field contains flags to determine if Temperature at observation time was taken in the morning or the evening (AM or PM). FLAG-2 field determines if the observation taken is a subplot within the primary plot.

MNyz Monthly mean minimum soil temperature.

HNyz Highest minimum soil temperature for the month.

:
:
:

LNyz Lowest minimum soil temperature for the month.
 MOyz Monthly mean soil temperature at observation time.
 HOyz Highest soil temperature at observation time.
 LOyz Lowest soil temperature at observation time.
 MXyz Monthly mean maximum soil temperature.
 HXyz Highest maximum soil temperature for the month.
 LXyz Lowest maximum soil temperature for the month.

CODE (y = Code for soil cover)
 (z = Code for soil depth)

y = 1	Grass	CODE	Depth	Depth
2	Fallow	(z=)	(inches)	(cm)
3	Bare ground			
4	Brome grass	1	2	5
5	Sod	2	4	10
6	Straw mulch	3	8	20
7	Grass muck	4	20	50
8	Bare muck	5	40	100
0	Unknown	0	unknown	

Temperature Data: Mean monthly maximum, mean monthly minimum, mean for month, departure from normal (in effect at the time data were processed). Highest and lowest with dates, frequency of maximum and minimum within categories, heating and cooling degree days (base 65 degrees F).

Precipitation Data: Total for month, departure from normal, (in effect at the time data were processed). Greatest observed daily amount and date, total snowfall for month, greatest depth of snow and date, and the number of days of precipitation with specified limits. (Example: number days with . 0.5 inch of precipitation.)

Evaporation Data: Total monthly wind mileage, total monthly evaporation, and mean maximum and minimum pan water temperature. (Began late 1960s.)

Freeze Data: Annual only. Lowest temperature and date of occurrence. Date of last spring minimum freezing temperatures and data of first fall minimum freezing temperatures occurring within five categories (less than or equal 32, 28, 24, 20, 16 degrees F). Number of days between freezing temperatures within the five categories.

Soil Temperature Data: Soil type, soil depth, and temperature data for various soil types and depths (mean monthly minimum and maximum, mean monthly at observation time, lowest and highest at observation time, lowest monthly minimum, highest monthly maximum).

:
:
:

Divisional Average Data: Temperature and precipitation monthly departures from normals (in effect at the time the data were processed). Number of days with rain, and monthly means (temperature, precipitation, and snowfall).

16-17	ELEMENT	The units and decimal position of the data value
	UNITS	for this record. Range of values is listed below.
	C	Whole degrees C (right justified)
	D	Whole Fahrenheit degree days (right justified)
	F	Whole degrees F (right justified)
	HI	Hundredths of inches
	I	Whole inches (right justified)
	M	Whole miles (right justified)
	MH	Miles per hour
	MM	Millimeters
	NA	No units applicable (non-dimensional)
	TC	Tenths of degrees C
	TF	Tenths of degrees F
	TI	Tenths of inches
	TM	Tenths of millimeters
	1	Soils - degrees F, soil depth in inches and 100ths
	2	Soils - degrees C, soil depth in whole centimeters
	3	Soils - degrees C, soil depth in inches and 100ths
	4	Soils - degrees F, soil depth in whole centimeters
	5	Soils - If the soil station closed during the current month, the "5" indicates the station has closed. At the end of the current processing year, the "5" will not appear in the annual DSI-3220 file.
18-21	YEAR	This is the year of record. Range = 1831-present.
22-22	AM-PM-SOIL	(Soil temperatures only.) Indicator used to determine if the soil temperature at observation time was taken in the morning or the evening.
	A	= Temperature reading at AM
	P	= Temperature reading at PM
	9	= Not applicable
23-23	SUB-PLOT-SOIL	(Soil temperatures only.) Indicator used to determine if the observation is for a primary plot or a plot within a primary plot (subplot).
	0	= Station plot only
	1	= 1st subplot
	2	= 2nd subplot
	3	= 3rd subplot
	4	= 4th subplot
	8	= 8th subplot
	9	= Not applicable
24-27	FILLER	Filler. Range = 9999.
28-30	NUMBER-VALUES	Number of values reported. Range = 1-13.

:
:
:

(A record may contain fewer or more data values than you might expect. A yearly record of monthly values may contain as few as 1 data value or as many as 13. This is primarily due to missing data. If a particular data value was not taken or is unavailable, there is no entry for it. Freeze data will always contain 10 data values.)

31-32	MONTH	Month of element value. Range = 1-13. 13 => annual value.
33-34	DAY	Day of element value, if applicable. Range = 00-31. 00 => elements are monthly means or number of days of occurrences of precipitation and/or temperatures within specified limits as listed in the ELEMENT-TYPE field.
35-40	DATA-VALUE	Actual data value. The first position (35) of this field is the "sign" of the meteorological data value. This position contains either a blank or a minus sign (never a plus sign). The remaining positions of this field contain a five-digit integer. Units and decimal position are indicated by the ELEMENT-UNITS field.
41-41	FLAG-1	Data Measurement Flag.
	A	Accumulated amount. This value is a total that may include data from a previous month or months (TPCP).
	B	Adjusted Total. Monthly value totals based on proportional available data across the entire month. (CLDD, HTDD, TEVP, TWND)
	E	An estimated monthly or annual total.
	I	Monthly means or totals based on incomplete time series. 1 to 9 days are missing. (DSNW, MMNT, MMXP, MMXT, MNTM, TCPC, TSNW)
	M	For variable length records, "M" is used only to indicate non-occurrence of a specified threshold in the freeze data element (FRZD). For fixed length records "M" stands for any data element missing.
	S	Precipitation is continuing to be accumulated. Total will be included in a subsequent value (TPCP).
		Example: Days 1-20 had 1.35 inches of precipitation, then a period of accumulation began. The element TPCP would then be 00135S and the total accumulated amount value appears in a subsequent monthly value.
		If TPCP = "99999" there was no precipitation measured during the month. Flag 1 is set to "S" and the total accumulated amount appears in a subsequent monthly value.
	T	Trace of precipitation, snowfall, or snowdepth. The

:
:
:

precipitation data value will = "00000". (EMXP, MXSD, TPCP, TSNW)

- + The phenomena in question occurred on several days. The date in the DAY field is the last day of occurrence. This flag was used through December 1983 only.

(blank) No report when data value = "99999".

42-42 FLAG-2 Data Quality FLAG. FLAG-2 is only used if FLAG-1 contains "T". Freeze data is the only exception. (See Freeze data table.)

A Accumulated amount.

E Estimated value.

+ Value occurred on more than 1 day - last date of occurrence is used.

3. **Start Date:** 18311101

4. **Stop Date:** Ongoing.

5. **Coverage:** Canada, Caribbean Islands, Central America (1960 - 1967 only), Pacific Islands, and the USA

6. **How to Order Data:**

Ask NCDC's Climate Services about the cost of obtaining this data set.

Phone: 828-271-4800

FAX: 828-271-4876

e-mail: NCDC.Orders@noaa.gov

7. **Archiving Data Center:**

National Climatic Data Center

Federal Building

151 Patton Avenue

Asheville, NC 28801-5001

Phone: (828) 271-4800.

8. **Technical Contact:**

National Climatic Data Center

Federal Building

151 Patton Avenue

Asheville, NC 28801-5001

Phone: (828) 271-4800.

9. **Known Uncorrected Problems:** The historical data were converted from existing digital files and structured into the element structure format. These data were processed through a gross value check and not the current edit system. It is NCDC's goal to bring these historical files up to the same level of quality as those from 1982 onward as resources become available. Thus, benign neglect, state of the art processing (circa 1952), and limited money/people resources have contributed toward less than optimum conditions in maintaining integrity of the digital files before 1982.

:
:
:

Soil data were added in January 1982 with approximately 250 stations reporting soil data. Soil data before 1982 are available in DSI-9639. In January 1987, the 1982 and 1983 soil data were removed from the primary period of record data tapes. 1982-83 soil data processing problems resulted in poor data quality of the monthly soils. These data are available on a separate magnetic tape containing just 1982-83 soil data.

There may be a few cases in which precipitation and temperature are in metric units but are not labeled as such in the "Element Units" field. This seems to be limited to data from the early 1960's from the U.S. Virgin Islands and Puerto Rico.

10. **Quality Statement:** Beginning with the data for January 1982, Cooperative data were processed through a completely revised system. Relying heavily on new computer editing procedures, data have been subjected to internal consistency checks, compared against climatological limits, checked serially, and evaluated against surrounding station observations.

11. **Essential Companion Datasets:** None.

12. **References:** None provided with original documentation.

:
:
: